

ture. Temporary drying hastened germination; strong light delayed it; temporary freezing had no effect. Germination takes place at 6°-10° C., but is hastened by higher temperature of 15°-20°.

DIRECTION OF LOCOMOTION IN STARFISH

Cole (Jour. Exp. Zool. Jan. 1913) finds that *Asterias forbesi* in the absence of directive stimuli, in crawling advances most frequently with that part of the body forward in which the madreporite occurs. He found a tendency in these animals to persist in moving with the same parts foremost in a series of succeeding trials; tho there is also a tendency to shift or "rotate" this anterior point successively to other parts. The author thinks the madreporic body may be what determines anteriority, and shows that the "physiological anterior" of the starfish corresponds in this respect to the anterior parts of the more bilateral spatangoids.

A ROTIFER PARASITIC IN EGG OF WATER SNAILS

Stevens (Jour. Queck. Micr. Club., Nov. 1912) describes a rotifer of the genus *Proales* which is able to bite a small opening in the tough egg membrane of the snail *Limnaea auricularia*, and by squeezing thru this enters the more fluid portion within. The rotifer feeds on the fluid gelatin of the egg with an occasional attack on the snail embryo itself. As the result of these attacks the snail embryo is finally killed.

In the meantime the rotifer lays its eggs, and later leaves this to enter still other eggs. The larvae hatch and undergo their development, devouring the dead snail embryo and other available substance of the egg. They too later escape and enter other eggs.

This looks somewhat like a parasite in the making. The author says the rotifers do not seem "at home" in the water while making their way from egg to egg.

EUGLENIDS AND THEIR AFFINITIES

Alexieff (Arch. Zool. Exp. Notes et Rev., No. 4. 1912) in connection with the discussion of certain euglenoid forms that are partly or largely parasitic on other animals, makes some interesting suggestions as to the relationships of Protozoa. He thinks the Euglenids

are near the flagellate source of the Sporozoa, and from thence as a main stem arise the Trypanosomes, Coccidians, Gregarines, Haemogregarines. He feels also that the Euglenids may give rise to lines leading to Cystoflagellates and Ciliates.

AN AMEBA WITH TENTACLES

Collin (*Arch. Zool. Exp. N. & R.*, No. 4, 1912) describes a new protozoan combining the characters of Ameba and the Suctorina. The organism has a gelatinous covering whose form is easily changed, and possesses tentacles by which it attaches itself to objects. It has the nuclear and pseudopodial structure of the Ameba. It is a marine form occurring in a culture of seaweed along with other amebæ and Foraminifera.

SOME AMERICAN RHIZOPODS AND HELIOZOA

Wailes (*Jour. Linn. Soc.* Dec. 17, 1913) reports 161 species and varieties of Rhizopods and 4 species of Heliozoa from collections made in 1911 at Augusta, Georgia, in New Jersey, and at various points in New York. Comment is made upon the small amount of work done on the American species of these groups since the time of Leidy.

Of these, 5 species and 10 varieties are new. Forty of them are recorded for the first time from the United States. About 80% of the species are similar to those found in Europe. The remainder are made of species rarely or not at all found in Europe. The author states that considerable local variation exists in some of the species.

SIZE OF CHROMOSOMES AND PHYLOGENY

Meek (*Jour. Linn. Soc.* Sept. 24, 1912), thru a study of the diameters of chromosomes, has reached the conclusion that there are three diameters of chromosomes found in animals,—.21 μ in Protozoa, .42 μ in low Metazoa, and .83 μ in high Metazoa. He holds that these measurements are remarkably constant. This arithmetic progression is believed by him to mean a lateral fusion of these chromatic elements in phylogeny.

In respect to length, the author finds, by study of spermatogen-